Foster Innovation and Accelerate/Mature Technology to Enable Future Force Capabilities While Exploiting Opportunities to Rapidly Transition Technology to the Current Force

**CURRENT FORCE**
- Predator/HELLFIRE
- TOW Bunker Buster
- Guided Multiple Launch Rocket System

**FUTURE FORCE**
- Small Organic Precision Munition (SOPM)
- Miniature Hit To Kill (MHTK)
- Close Combat Missile Modernization
- Extended Area Protection & Survivability
- LOW-cost, Extended Range Air Defense

Enabling the Future Force

Enhancing the Current Force
"... as we end today’s wars, we will focus on a broader range of challenges and opportunities, including the security and prosperity of the Asia Pacific."

- Barack Obama, President of the United States

"... we are shaping a Joint Force that will be smaller, leaner, but will be more agile, flexible, ready, and technologically advanced. ...ensuring that we can meet any future threats by investing in our people and a strong industrial base."

- Leon Panetta, United States Secretary of Defense

"The Department will make every effort to maintain an adequate industrial base and our investment in science and technology."

- Sustaining US Global Leadership, p.8
"Research is about people."
– Zachary J. Lemnios,
  Assistant Secretary of Defense for Research &
  Engineering for the Department of Defense

“A lot of times people don’t know what they want until you show them.”
– Steve Jobs
**GROUND DOMAINS**

**PROTECTION**
Protect the force and selected geopolitical assets from aerial attack, missile attack and surveillance
- Air Defense
- Area Protection
- Platform Protection

**AVIATION WEAPONS**
Find, fix, and destroy the enemy through fire and maneuver; and to provide combat, combat service and combat service support in coordinated operations as an integral member of the combined arms team

**GROUND TACTICAL (CLOSE COMBAT)**
Direct fire weapons, supported by indirect fire, air-delivered fires, and nonlethal engagement means to decide the outcome of battles and engagements

**FIRE SUPPORT**
Destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to help integrate fire support assets into combined arms operations
AMRDEC FY12 Missile Program

**Warhead & Fuze Integration**
- Advanced Warheads for Scalable Effects Munitions (AWSEM)
- Enabling Fuze Components

**Processing**
- Multi-Spectral/Multi-Channel Algorithm
- Autotracker/Peopletracker

**Seeker**
- AESA
- SAR
- Advanced Seeker Dome
- Uncooled IR

**Navigation**
- Image Gyro
- GEM
- GPS Guidance

**Propulsion**
- Energetics Materials Synthesis
-Insensitive Munitions
-Multi-Mission/Multi-Purpose Prop
-Cold Temperature Propellant

**Actuators/Controls**
- Thrusters
-Tail Control

**Power**
- Nanotechnology for Batteries

**Datalink**
- Datalink Technology

**Emerging Technologies**

**Launcher & Structures Technology**
- Aerodynamics
- Affordability

**Missile Systems Technologies**
- Simulation
- Missile Sustainment

**Technical Fire Control**

**System Concept Demos**

**AMRDEC**

**Technology Driven. Warfighter Focused.**
Close Combat Missile Modernization

Attributes:
- Extended Range & Decreased TOF
- F&F & Extended Range
- Networking/Cooperative Engagement
- Lethality Against Multiple Target Sets
- Reduced Weight

Payoff:
- Achieve lethal effects at extended range
- Increased target identification range
- Increased survivability
- Increased stowed kills, reduced logistics burden
- Transition to PM CCWS for FY18 POR

Close Combat Missile Modernization to ensure range and lethality overmatch against future threat systems and precision lethality needed for hybrid warfare operations
Extended Area Protection & Survivability (EAPS)

FY09-FY15: Critical Technologies & Key Elements Integrated and Flight Demonstrated

Technical Fire Control
Demonstrate fire control sensors, missile and bullet projectiles, and guns/launchers can be integrated into a weapons system capable of meeting mission requirements.

Fire Control Sensor
Demonstrate fire control sensor technology and prototype hardware that supports projectile concepts and flight demonstration.

• Track
• Illuminate

Intercept Target

• Guide to Target

Launcher Integration
Demonstrate missile integration into the vertical launcher and course corrected bullet and gun integration.

• Launch

Notional Battle Element and Concept of Operation

Program Objective
Develop & flight-demonstrate prototype hardware in support of system concepts, bridging the gap between initial C-RAM and the objective EAADS capabilities and providing mobile, 360 degree hemispherical extended area protection against RAM threats.

Threat
• Mortars
• Artillery
• Rockets
• Unmanned Arial Vehicles
• Cruise Missiles
• Rotary Wing Aircraft

Projectile
Demonstrate missile and bullet technology and prototype hardware through flight demonstration and intercept/defeat of RAM targets.

Approved for public release; distribution unlimited. Review completed by the AMRDEC Public Affairs Office 4 March 2009; FN3881.
Small Organic Precision Munition

**LETHAL MINIATURE AERIAL MUNITION SYSTEM (LMAMS)**
A SMALL PRECISION, SOLDIER-CARRIED, SOLDIER-LAUNCHED, LOITERING, PRECISION MUNITION SYSTEM

**Mature, Integrate, & Flight Demonstrate:**
- **IMAGE STABILIZATION/AUTOTRACKER** for increased day/night target acquisition and reduced operator workload
- **INTEGRATED WARHEAD, FUZE, & PROXIMITY SENSOR** for increased lethality in obscured battlefields and increased IM compliance
- **DIGITAL DATA LINK** for secure, reliable communication over flight trajectories
- **ROBUST POWER SYSTEMS** for reliable, low-maintenance system operation in all temperature environments

**Payoff:**
- Improved situational awareness, lethality, and survivability against
  - Combatants on ridgelines or overhangs
  - Snipers in close urban terrain
  - Insurgents placing IEDs or fleeing
  - Small Fwd. Operating Base protection
- Reduced collateral damage/fratricide
- Transition to PM CCWS for FY15 LMAMS POR

**LMAMS critical component technology to enable small units to defeat enemy personnel/soft targets in urban/complex terrain without exposure to direct enemy fires and with low collateral damage**
LOW-cost, Extended Range Air Defense (LOWER-AD) System

**Products:**
- Low cost C-UAS/CM interceptor with manufacturing cost < $150k per kill
- Extended range intercept > 25km
- Affordable Active Seeker Technology
- Integrated System Demonstrated at TRL6/7

**Payoff:**
- Defeat of most likely and most stressing UAS threats with capability against Cruise Missiles, Large Caliber Rockets, Fixed and Rotary Wing Aircraft
- Active seeker enabling extended range intercept and use of existing radars
- Affordable, enabling missile technology with high-degree of reuse by other programs
- Interoperability with existing Force Structure

**Transition:**
- PEO M&S, Cruise Missile Defense Systems Project Office and Counter Rockets, Artillery, and Mortars Project Office
Low-Cost Tactical Extended Range Missile (LC TERM)

Enabling Technologies:
- Thermal barrier / pulse motor
- Investigating commonality in GNC/electronics with GMLRS
- Investigate integration of GMLRS warheads and fuzes
- Innovative navigation concepts for precision engagements in GPS denied environment
- Scalable Effects and/or Electronic Attack payloads

Warfighter Payoff:
- Greatly reduced costs per round
- Dramatic increase in number of serviceable targets as defined by TRADOC scenarios due to range extension
- Munition is capable of 200km+ carrying a 200 lb warhead

Requirements:
- Concept must be compatible with current launchers
- Changes must show a dramatically reduction in cost
- Current performance of MFOM cannot be degraded

Low-cost precision fires variant capable of servicing target at a 200 km range threshold with a 200lb class warhead; Aim is to provide extended range capability for a cost much less than current fire support options
Purpose:
To ensure that Army Aviation has munitions suitable for the Full Spectrum of Warfare Operations.

Attributes:
- Compatibility Across Aviation Platforms (Manned and Unmanned):
  - Small Size
  - Lightweight
  - Reduced Power Consumption
- Reduced Life Cycle Costs:
  - Modular Munition Subsystems
  - Open Architecture Internal Interfaces
- Selectable Lethality

Payoff:
- Improved effects against fleeting/moving targets
- Reduced kill chain timeline
- Improved effectiveness against soft target set
- Improved control of collateral damage
- Increased stowed kill/endurance options for aviation platforms
- Reduced logistics burden
- Reduced acquisition schedule & cost for new capabilities

Develop and demonstrate critical technologies and UAS integration approach to improve sensor to shooter synergy across Army Aviation operations

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.
✓ **Flexibility**

✓ **Affordability**

✓ **Improved Reliability**

✓ **Reduced Logistics Burden**